# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

## REQUEST FOR FILING NATIONAL PHASE OF PCT APPLICATION UNDER 35 U.S.C. 371 AND 37 CFR 1.494 OR 1.495

To: Hon. Commissioner of Patents
Washington, D.C. 20231

00909

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

Atty Dkt: P 290634 /2990515US/HS/kop
M# /Client Ref.

From: Pillsbury Winthrop LLP, IP Group:

Date: February 26, 2002

This is a **REQUEST** for **FILING** a PCT/USA National Phase Application based on:

| 1. International Application | 2. International Filing Date | 3. Earliest Priority Date Claimed |
|---|---|---|
| PCT/FI00/00742 | 1 September 2000 | 2 September 1999 |
| ⇧ country code | Day MONTH Year | Day MONTH Year (use item 2 if no earlier priority) |

4. Measured from the earliest priority date in item 3, this PCT/USA National Phase Application Request is being filed within:

(a) ☐ 20 months from above item 3 date (b) ☒ 30 months from above item 3 date,

(c) Therefore, the due date (unextendable) is March 2, 2002

5. Title of Invention CHARGING FOR PREPAID SUBSCRIBERS IN A TELECOMMUNICATION SYSTEM

6. Inventor(s) HAATAJA et al.

Applicant herewith submits the following under 35 U.S.C. 371 to effect filing:

7. ☒ Please immediately start national examination procedures (35 U.S.C. 371 (f)).

8. ☒ **A copy of the International Application** as filed (35 U.S.C. 371(c)(2)) is transmitted herewith (file if in English but, if in foreign language, file only if not transmitted to PTO by the International Bureau) including:

a. ☒ Request;
b. ☒ Abstract;
c. 19 pgs. Spec. and Claims;
d. 3 sheet(s) Drawing which are ☐ informal ☒ formal of size ☒ A4 ☐ 11"

9. ☒ **A copy of the International Application has been transmitted by the International Bureau.**

10. **A translation of the International Application** into English (35 U.S.C. 371(c)(2))

a. ☐ is transmitted herewith including: (1) ☐ Request; (2) ☐ Abstract;
(3) _____ pgs. Spec. and Claims;
(4) _____ sheet(s) Drawing which are:
☐ informal ☐ formal of size ☐ A4 ☐ 11"

b. ☒ is not required, as the application was filed in English.

c. ☐ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.

d. ☐ Translation verification attached (not required now).

RE: USA National Phase Filing of PCT /FI00/00742

JC13 Rec'd PCT/PTO 26 FEB 2002

11. ☒ Please see the attached Preliminary Amendment

12. ☐ Amendments to the claims of the International Application **under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., before 18th month from first priority date above in item 3, are transmitted herewith (file only if in English) including:**

13. ☒ PCT Article 19 claim amendments (if any) have been transmitted by the International Bureau

14. ☐ Translation of the amendments to the claims **under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., of claim amendments** made before 18th month, **is attached (required by 20th month from the date in item 3 if box 4(a) above is X'd, or 30th month if box 4(b) is X'd, or else amendments will be considered canceled).**

15. **A declaration of the inventor** (35 U.S.C. 371(c)(4))
a. ☒ is submitted herewith ☒ Original ☐ Facsimile/Copy
b. ☐ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.

16. **An International Search Report (ISR):**
a. Was prepared by ☐ European Patent Office ☐ Japanese Patent Office ☒ Other
b. ☒ has been transmitted by the international Bureau to PTO.
c. ☒ copy herewith (2 pg(s).) ☒ plus Annex of family members (1 pg(s).).

17. **International Preliminary Examination Report** (IPER):
a. ☒ has been transmitted (if this letter is filed after 28 months from date in item 3) in English by the International Bureau with Annexes (if any) in original language.
b. ☐ copy herewith in English.
c.1 ☐ IPER Annex(es) in original language ("Annexes" are amendments made to claims/spec/drawings during Examination) including attached amended:
c.2 ☐ Specification/claim pages #__ claims #
Dwg Sheets #
d. ☐ Translation of Annex(es) to IPER **(required by 30th month due date, or else annexed amendments will be considered canceled).**

18. **Information Disclosure Statement** including:
a. ☒ Attached Form PTO-1449 listing documents
b. ☒ Attached copies of documents listed on Form PTO-1449
c. ☒ A concise explanation of relevance of ISR references is given in the ISR.

19. ☒ **Assignment** document and Cover Sheet for recording are attached. Please mail the recorded assignment document back to the person whose signature, name and address appear at the end of this letter.

20. ☐ Copy of Power to IA agent.

21. ☐ **Drawings** (complete only if 8d or 10a(4) not completed): __ sheet(s) per set: ☐ 1 set informal; ☐ Formal of size ☐ A4 ☐ 11"

22. Small Entity Status ☒ is **Not** claimed ☐ is claimed (**pre**-filing confirmation required)
22(a) __ (No.) Small Entity Statement(s) enclosed (since 9/8/00 Small Entity Statements(s) not essential to make claim)

23. **Priority** is hereby claimed under 35 U.S.C. 119/365 based on the priority claim and the certified copy, both filed in the International Application during the international stage based on the filing in (country) FINLAND of:

| | Application No. | Filing Date | | Application No. | Filing Date |
|---|---|---|---|---|---|
| (1) | 19991874 | September 2, 1999 | (2) | | |
| (3) | | | (4) | | |
| (5) | | | (6) | | |

a. ☒ See Form PCT/IB/304 sent to US/DO with copy of priority documents. If copy has not been received, please proceed promptly to obtain same from the IB.
b. ☐ Copy of Form PCT/IB/304 attached.

RE: USA National Phase Filing of PCT/FI00/00742

24. Attached: INFORMATION DISCLOSURE STATEMENT; COPYOF FINNISH OFFICE ACTION, CITED REFERENCE

25 Per Item 17.c2, **cancel original** pages #___, claims #___, Drawing Sheets #

26. **Calculation of the U.S. National Fee (35 U.S.C. 371 (c)(1)) and other fees is as follows:**
Based on amended claim(s) per above item(s) ☐ 12, ☐ 14, ☐ 17, ☐ 25 (hilite)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Effective Claims | 17 | minus 20 = | 0 | x $18/$9 | = | $0 | 966/967 |
| Independent Claims | 6 | minus 3 = | 3 | x $84/$42 | = | $252 | 964/965 |
| If any proper (ignore improper) Multiple Dependent claim is present, | | | | add$280/$140 | | +0 | 968/969 |

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4)): →→ **BASIC FEE REQUIRED, NOW** →→→→

A. If country code letters in item 1 are **not** "US","BR","BB","TT","MX","IL" "NZ", "IN" or "ZA"

See item 16 re:

1. Search Report was not prepared by EPO or JPO - - - - - - - - - add$1,040/$52 0 960/961
2. Search Report was prepared by EPO or JPO - - - - - - - - - - - add$890/$445 +1040 970/971

**SKIP B, C, D AND E UNLESS country code letters in Item 1 are "US","BR","BB","TT","MX","IL", "NZ", "IN", "ZA", "LC" or "PH"**

(X) → ☐ B. If USPTO did not issue both International Search Report (ISR) and (if box 4(b) above is X'd) the International Examination Report (IPER), - - - - - - - - - - - - - - - - - - add$1,040/$52 0 +0 960/961

(only) (one) → (of) ☐ C. If USPTO issued ISR but not IPER (or box 4(a) above is X'd), - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - add$740/$370 +0 958/959

(these) ( 4) → (boxes) ☐ D. If USPTO issued IPER but IPER Sec. V boxes not all 3 YES, - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - add$710/$355 +0 956/957

→ ☐ E. If international preliminary examination fee was paid to USPTO and Rules 492(a)(4) and 496(b) satisfied (in IPER Sec. V all 3 boxes must be YES for all claims), - - add $100/$50 +0 962/963

27. **SUBTOTAL =** $1292

28. If Assignment box 19 above is X'd, add Assignment Recording fee of ----$40 +40 (581)

29. If box 15a is x'd, determine whether inventorship on Declaration is different than in international stage. If yes, add (per Rule 497(d) ----$130 +0 (098)

30. Attached is a check to cover the - - - - - - - - - - - - - - - - - - - - - - - **TOTAL FEES** $1332

Our Deposit Account No. 03-3975
Our Order No. 60258 (C#) | 290634 (M#)

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**CHARGE STATEMENT:** The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 and 492 (missing or insufficient fee only) now or hereafter relative to this application and the resulting Official document under Rule 20, or credit any overpayment, to our Account/Order Nos. shown above for which purpose a duplicate copy of this sheet is attached.
**This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal form is filed**

**Pillsbury Winthrop LLP**
**Intellectual Property Group**

**By Atty:** Christine H. McCarthy **Reg. No.** 41844

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**Atty/Sec: CHM/JRH**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. National Stage Application of PCT/FI00/00742

HAATAJA et al. Group Art Unit: Not Yet Assigned

Appln. No.: Not Yet Assigned Examiner: Not Yet Assigned

Filed: February 26, 2002

FOR: CHARGING FOR PREPAID SUBSCRIBERS IN A TELECOMMUNICATON SYSTEM

* * * * *

February 26, 2002

**PRELIMINARY AMENDMENT**

Hon. Commissioner of Patents
Washington, DC 20231

Sir:

Before beginning examination, kindly amend the above-identified application as follows:

IN THE SPECIFICATION:

On the first page, just after the title, please insert the following paragraph:

--This is a National Stage application of International Application No. PCT/FI00/00742, which was filed on September 1, 2000, which designated the U.S., and was filed in the English language.--

IN THE CLAIMS:

Kindly amend claims 1-17 as follows:

1. (Amended) A method for customizing the charging of subscribers in a telecommunications network, the method comprising:

maintaining subscriber information on at least one subscriber;

defining at least two different tariff models, each model containing a tariff scheme defining how to charge a call;

indicating in the subscriber information directly or indirectly which tariff model is to be used with this subscriber; and

charging the subscriber according to the tariff scheme of the indicated tariff model.

2. (Amended) A method as claimed in claim 1, the method further comprising defining one tariff model to be a default model which is used when no other tariff model is indicated.

3. (Amended) A method as claimed in claim 1, wherein the telecommunications network offers a prepaid service to its subscribers and said at least one subscriber is a prepaid subscriber.

4. (Amended) A method as claimed in claim 3, the method further comprising:

using at least two different types of vouchers for making deposits into subscribers prepaid accounts;

attaching one tariff model at least to each of said two different types of vouchers;

indicating in the subscriber information the type of voucher this subscriber is currently using; and

determining the tariff model to be used on the basis of the voucher this subscriber is currently using.

5. (Amended) A method as claimed in claim 4, the method further comprising:

defining in the subscriber information the voucher types allowed to this subscriber;

checking from the subscriber information during depositing if the voucher is allowed to this subscriber; and

if the voucher is an allowed one, continuing depositing;

if the voucher is not an allowed one, terminating depositing.

6. (Amended) A method as claimed in claim 4, the method further comprising:

defining at least two different prepaid profiles, each profile defining at least the allowed voucher types;

associating a subscriber's subscriber information with one profile;

checking during depositing if the voucher is allowed to this subscriber from the profile definitions indicated in the subscriber information; and

if the voucher is an allowed one, continuing depositing;

if the voucher is not an allowed one, terminating depositing.

7. (Amended) A method as claimed in claim 1, the method further comprising:

defining at least two different subscriber profiles;

attaching at least to each of said two different profiles one tariff model;

indicating in the subscriber information the profile of the subscriber;

determining the tariff model to be used on the basis of the subscriber's profile.

8. (Amended) A method for customizing the charging of prepaid subscribers in a telecommunications network offering a prepaid service, the method comprising:

using at least two different types of vouchers for making deposits into subscribers prepaid accounts;

defining at least two different tariff models, each model containing a tariff scheme defining how to charge a call;

attaching at least to each of said two types of vouchers one tariff model;

determining the tariff model to be used on the basis of the voucher this subscriber is currently using; and

charging the subscriber according to the tariff scheme of the tariff model.

9. (Amended) A telecommunications system comprising at least one database having subscriber information on at least one subscriber,

wherein

the system is arranged to maintain definitions of at least two different kinds of tariff models, each tariff model containing a tariff scheme defining how to charge a call, and to charge the subscriber according to the tariff scheme of the tariff model indicated directly or indirectly in the subscriber information.

10. (Amended) A system as claimed in claim 9, wherein the system is arranged to use one tariff model, defined as a default tariff model, when no other tariff model is indicated.

11. (Amended) A system as claimed in claim 9, wherein the system offers prepaid service to its subscribers and said at least one subscriber is a prepaid subscriber.

12. (Amended) A system as claimed in claim 11, wherein the system is arranged to use at least two different types of vouchers for depositing subscribers prepaid accounts, and to maintain information on types of vouchers allowed to the subscriber and to check during depositing if the voucher the subscriber is depositing is an allowed one.

13. (Amended) A network element controlling charging of a subscriber in a telecommunications system, the network element being arranged to be in connection with the subscriber information maintained in telecommunications system,

wherein

the network element is arranged to find out which of the tariff models defined in the system is to be used with this subscriber from the subscriber information indicating the subscriber's tariff model directly or indirectly, each tariff model containing a tariff scheme defining how to charge a call, and to use the tariff scheme of the indicated tariff model when charging the subscriber.

14. (Amended) A database comprising subscriber information in a telecommunications system,
wherein

the database also comprises at least two different kinds of tariff models, each model containing a tariff scheme defining how to charge a call, and

the subscriber information indicates directly or indirectly which tariff model is to be used with a subscriber.

15. (Amended) A database as claimed in claim 14, wherein

the database also comprises at least two different kinds of profile definitions to each of which one tariff model is attached,

the subscriber information comprises information on which profile to use with the subscriber, and

the database is arranged to deduce the tariff model of the subscriber from the profile.

16. (Amended) A database as claimed in claim 14, wherein

the telecommunications system is a system offering a prepaid service to subscribers and the subscribers may deposit their prepaid accounts by means of vouchers,

the database also comprises voucher information for at least two different types of vouchers,

the subscriber information comprises information on the type of voucher the subscriber is currently using, and

the database is arranged to deduce the tariff model of the subscriber from the voucher information on the basis of the voucher type the subscriber is currently using.

17. (Amended) A database comprising voucher information in a telecommunications system offering a prepaid service to subscribers, in which system the subscribers may deposit their prepaid accounts by means of vouchers,

wherein

the database also comprises at least two different kinds of tariff models, each model containing a tariff scheme defining how to charge a call,

the voucher information comprises information on at least two different types of vouchers, attaching each of said at least two different types of vouchers to one tariff model, and

the database is arranged to deduce the tariff model of a subscriber from the voucher information on the basis of the voucher type the subscriber is currently using.

Please see the attached Appendix for changes made to the claims.

REMARKS

Claims 1-17 are pending in this National Stage application. By this Amendment, these claims are amended to further conform to U.S. practice, *e.g.,* to remove reference numerals and multiple dependencies. No new material is added to the claims.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached Appendix is captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE"**.

Respectfully submitted,

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By: _____

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Enclosure: Appendix

## APPENDIX
## VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The priority claim is recited.

IN THE CLAIMS:

1. (Amended) A method for [customising] customizing the charging of subscribers in a telecommunications network, the method comprising [the steps of]:

maintaining subscriber information on at least one subscriber;

[characterized by]

defining at least two different tariff models, each model containing a tariff scheme defining how to charge a call;

indicating in the subscriber information directly or indirectly which tariff model is to be used with this subscriber; and

charging the subscriber according to the tariff scheme of the indicated tariff model.

2. (Amended) A method as claimed in claim 1, [characterized by] the method further comprising [the step of] defining one tariff model to be a default model which is used when no other tariff model is indicated.

3. (Amended) A method as claimed in claim 1[ or 2], [characterized by] wherein the telecommunications network [offering] offers a prepaid service to its subscribers and said at least one subscriber [being] is a prepaid subscriber.

4. (Amended) A method as claimed in claim 3, [characterized by] the method further comprising[ the steps of]:

using at least two different types of vouchers for making [deposis] deposits into subscribers prepaid accounts;

attaching one tariff model at least to each of said two different types of vouchers;

indicating in the subscriber information the type of voucher this subscriber is currently using; and

determining the tariff model to be used on the basis of the voucher this subscriber is currently using.

5. (Amended) A method as claimed in claim 4, [characterized by] the method further comprising[ the steps of]:

defining in the subscriber information the voucher types allowed to this subscriber;

checking from the subscriber information during depositing if the voucher is allowed to this subscriber; and

if the voucher is an allowed one, continuing depositing;

if the voucher is not an allowed one, terminating depositing.

6. (Amended) A method as claimed in claim 4, [characterized by] the method further comprising[ the steps of]:

defining at least two different prepaid profiles, each profile defining at least the allowed voucher types;

associating a subscriber's subscriber information with one profile;

checking during depositing if the voucher is allowed to this subscriber from the profile definitions indicated in the subscriber information; and

if the voucher is an allowed one, continuing depositing;

if the voucher is not an allowed one, terminating depositing.

7. (Amended) A method as claimed in [claims] claim 1,[ 2 or 3, characterized by] the method further comprising[ the steps of]:

defining at least two different subscriber profiles[,];

attaching at least to each of said two different profiles one tariff model;

indicating in the subscriber information the profile of the subscriber;

determining the tariff model to be used on the basis of the subscriber's profile.

8. (Amended) A method for customizing the charging of prepaid subscribers in a telecommunications network offering a prepaid service, the method comprising [the steps of]:

using at least two different types of vouchers for making deposits into subscribers prepaid accounts;

[characterized by ]

defining at least two different tariff models, each model containing a tariff scheme defining how to charge a call;

attaching at least to each of said two types of vouchers one tariff model;

determining the tariff model to be used on the basis of the voucher this subscriber is currently using; and

charging the subscriber according to the tariff scheme of the tariff model.

9. (Amended) A telecommunications system [(S)] comprising at least one database [(SMP)] having subscriber information [(SI)] on at least one subscriber,

[characterized in that] wherein

the system [(S)] is arranged to maintain definitions [(TM)] of at least two different kinds of tariff models, each tariff model containing a tariff scheme defining how to charge a

call, and to charge the subscriber according to the tariff scheme of the tariff model indicated directly or indirectly in the subscriber information[ (SI)].

10. (Amended) A system [(S)] as claimed in claim 9, [characterized in that] wherein the system is arranged to use one tariff model, defined as a default tariff model, when no other tariff model is indicated.

11. (Amended) A system [(S)] as claimed in claim 9[ or 10], [characterized in that] wherein the system [(S)] offers prepaid service to its subscribers and said at least one subscriber is a prepaid subscriber.

12. (Amended) A system [(S)[ as claimed in claim 11, [characterized in that] wherein the system [(S)] is arranged to use at least two different types of vouchers for depositing subscribers prepaid accounts, and to maintain information on types of vouchers allowed to the subscriber and to check during depositing if the voucher the subscriber is depositing is an allowed one.

13. (Amended) A network element [(SCP)] controlling charging of a subscriber in a telecommunications system, the network element being arranged to be in connection with the subscriber information maintained in telecommunications system,

[characterized in that] wherein

the network element [(SCP)] is arranged to find out which of the tariff models defined in the system is to be used with this subscriber from the subscriber information indicating the subscriber's tariff model directly or indirectly, each tariff model containing a tariff scheme

defining how to charge a call, and to use the tariff scheme of the indicated tariff model when charging the subscriber.

14. (Amended) A database [(SMP)] comprising subscriber information in a telecommunications system,

[characterized in that] wherein

the database [(SMP)] also comprises at least two different kinds of tariff models [(TM)], each model containing a tariff scheme defining how to charge a call, and

the subscriber information [(SI)] indicates directly or indirectly which tariff model is to be used with a subscriber.

15. (Amended) A database [(SMP)] as claimed in claim 14, [characterized in that] wherein

the database also comprises at least two different kinds of profile definitions [(PP)] to each of which one tariff model is attached,

the subscriber information [(SI)] comprises information on which profile to use with the subscriber, and

the database [(SMP)] is arranged to deduce the tariff model of the subscriber from the profile.

16. (Amended) A database [(SMP)] as claimed in claim 14, [characterized in that] wherein

the telecommunications system is a system offering a prepaid service to subscribers and the subscribers may deposit their prepaid accounts by means of vouchers,

the database also comprises voucher information [(VI)] for at least two different types of vouchers,

the subscriber information [(SI)] comprises information on the type of voucher the subscriber is currently using, and

the database [(SMP)] is arranged to deduce the tariff model of the subscriber from the voucher information [(VI)] on the basis of the voucher type the subscriber is currently using.

17. (Amended) A database [(SMP)] comprising voucher information [(VI)] in a telecommunications system offering a prepaid service to subscribers, in which system the subscribers may deposit their prepaid accounts by means of vouchers,

[characterized in that] wherein

the database [(SMP)] also comprises at least two different kinds of tariff models [(TM)], each model containing a tariff scheme defining how to charge a call,

the voucher information comprises information on at least two different types of vouchers, attaching each of said at least two different types of vouchers to one tariff model, and

the database [(SMP)] is arranged to deduce the tariff model of a subscriber from the voucher information [(VI)] on the basis of the voucher type the subscriber is currently using.

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# CHARGING FOR PREPAID SUBSCRIBERS IN A TELECOMMUNICATIONS SYSTEM

## Background of the invention

**[0001]** The present invention relates to a method and an equipment for enabling versatile charging in telecommunications systems and especially more versatile charging for prepaid subscribers. A prepaid subscriber refers to a subscriber using prepaid subscription, i.e. a subscriber who has paid in advance.

**[0002]** In mobile telecommunications systems, such as the pan-European digital mobile communications system GSM (Global System for Mobile Communications), call prices depend usually on the time when the call is made. To be able to offer more versatile charging possibilities some operators offer prepaid service for subscribers. A prepaid service is a service where a subscriber pays in advance his calls by buying vouchers. The prepaid service logic and prepaid service data are stored in the system. A prepaid SIM (Subscriber Identity Module) card comprises an MSISDN number which is associated with the prepaid service data, including the subscriber's credit, in the system. A prepaid service allows payment of a telephone bill in advance or setting an upper limit for the telephone bills. As another benefit, the prepaid service enable roaming subscribers to pay their local calls at local tariffs, whereas the use of the SIM card of their home service provider results in paying international tariffs to their home network and back.

**[0003]** Usually a prepaid subscription is activated and money added to subscriber's prepaid account by means of vouchers. Some of the service providers sell different types of vouchers, which differ from each other e.g. in the number of call units and the time the call time bought is valid. However, the calls are charged in the same way regardless of what kind of a voucher is used.

**[0004]** The above described possibilities for charging calls are insufficient, since the needs of mobile subscribers and their use of their mobile stations are becoming more and more differentiated. There are users making lot of calls during office hours whereas some other users call seldom and during evenings, for example. The charging of calls has to be diversified correspondingly.

**Disclosure of the invention**

**[0005]** The object of the invention is to provide versatile charging possibilities that are easy to maintain and define by the operator. The object of the invention is achieved with methods, a system, a network element and databases which are characterized in what is disclosed in the independent claims. The preferred embodiments of the invention are set forth in the dependent claims.

**[0006]** The invention is based on defining at least two different kinds of tariff models and associating a subscriber's information directly or indirectly with a tariff model which is used when the subscriber makes a call. With tariff models the charging of subscribers is easily diversified.

**[0007]** The advantages of the invention are that the service provider can customize the charging very easily and for example direct some users to call during times when the network is not very loaded.

**[0008]** In one embodiment of the invention, where the prepaid service is used, each voucher type has a tariff model. The further advantage of this embodiment is that a subscriber can change his tariff model by changing the voucher type he is using.

**[0009]** In another embodiment of the invention, where the prepaid service is used, voucher types allowed for subscribers are defined. The further advantage of this embodiment is that the operator can restrict the subscriber's freedom to choose a tariff model to be used.

**Brief description of the figures**

**[0010]** The invention will be described in further detail in the following by means of preferred embodiments with reference to the accompanying drawings, in which

**[0011]** Figure 1 is a block diagram showing some relevant network elements in a first preferred embodiment of the invention;

**[0012]** Figure 2 is a block diagram showing some relevant elements of the SMP in the first preferred embodiment of the invention;

**[0013]** Figure 3 is a flow chart illustrating charging in the first preferred embodiment; and

**[0014]** Figure 4 is a flow chart illustrating depositing in the first preferred embodiment.

**Detailed description of the invention**

**[0015]** Figure 1 is a block diagram of a telecommunications system S equipped with an arrangement according to a first preferred embodiment of the invention. The telecommunications network is assumed to be a public land mobile network PLMN, without, however, limiting the invention to that kind of particular network. The invention can be used in any telecommunications systems where subscribers have subscription information stored in the system and the subscription information is used when calls are charged.

**[0016]** The embodiment illustrated in Figure 1 makes use of Intelligent Network technology. An intelligent network IN is able to provide a subscriber of a telecommunications network, such as a wired network or a mobile telephone network, with a plurality of services. An example of such an intelligent network is described in recommendations of the ITU-T Q-1200 series, of which Q-1210 to Q-1219 define a set of features known as CS-1 (Capability Set 1), and correspondingly, Q-1220 to Q-1229 define a set of features CS-2. The invention and its back-

ground will be described by the terminology of recommendation ETS 300 374-1 CorelNAP, but the invention can also be employed in intelligent networks implemented according to other intelligent network standards.

**[0017]** Figure 1 shows some elements of an intelligent network which are relevant to the understanding of the invention, such as what are known as intelligent peripherals IP. Usually an IP is associated with a specialized resource function SRF which is an interface for network mechanisms associated with interaction with a subscriber. Thus an IP may comprise e.g. more advanced speech handling functions than do exchanges in general. The IVR application is usually located in the IP. The IVR application, also called the PrePaid service IVR application, is an interactive voice response application that allows the subscriber to make a deposit (add money, recharge) into his PrePaid SIM account by entering the identification number of a prepaid voucher. The IP is connected to an SSP using for example ISUP (ISDN User Part) signalling and one or more voice transports.

**[0018]** The SSP (Service Switching Point) is a network element performing service switching function (SSF). The SSP may be a mobile service switching centre MSC, which includes the SSF. The SSF is an interface between a conventional call control function CCF and the service control function SCF of an intelligent network. The network element performing the SCF is called a service control point SCP. An intelligent network service is produced by the service switching point SSP inquiring instructions from the service control point SCP by means of messages to be transmitted across the SSP/SCP interface upon the encounter of detection points associated with the service. In association with an intelligent network service, a service logic program is started at the service control point SCP, the operation of the program determining the messages transmitted by the SCP to the SSP

at each stage of a call. During one call there may be several service logic programs started and ended. The service logic program handling a prepaid call runs during the whole call, since it controls credit updating. Usually the SCP controls the charging and adjusts the charging on the basis of information it gets from the SSP. The credit updating according to the invention is discussed in greater detail in Figure 3.

**[0019]** However, usually the SCP is not used in the service logic of the Prepaid SIM IVR recharge application, i.e. calls to the IVR are routed by the CCF directly to the IVR on the basis of the service number which the subscriber has dialled in order to recharge (deposit).

**[0020]** In the example illustrated in Figure 1, prepaid subscriber information, information about vouchers, prepaid profile definitions and tariff models are in a database located in a service management point SMP as is described in greater detail in Figure 2. Alternatively, they may be located in different databases and/or in some other network element, like a home location register HLR (not shown in Figure 1). The database may also be a decentralized database. The IVR interfaces the SMP database through a service management interface SMI. The SMP and the IP may be connected e.g. through a local area network (LAN) using TCP/IP (Transmission Control Protocol/Internet Protocol). The connection between the IP and the SMP, illustrated by a dashed line, represents only management connection without any signalling connection.

**[0021]** The service management access point SMAP provides some selected users, such as service providers and network operators, with access to the service data of the service management point SMP through a public telephone network, such as the PSTN or the ISDN, a cellular radio network (such as the GSM) or a public data network (X.25, the Internet) and an open interface.

The SMAP interacts directly with the SMP. Furthermore, the SMAP can provide access to a network element of another telecommunications network. The operator can define and redefine tariff models via the SMAP. The SMAP is described in greater detail in PCT patent application WO98/41038 which is incorporated herein by reference.

**[0022]** Network operators and service providers are nowadays separated. A service provider buys the required bearer services from a network operator. A network operator may also be a service provider. An operator may also have multiple service providers.

**[0023]** Figure 2 is a block diagram showing the relevant parts of the SMP in the first preferred embodiment of the invention. In the first preferred embodiment of the invention, each voucher type VT is associated with one tariff model TM-ID and subscriber information SI comprises information about the voucher type currently in use, VTu. With this information, the tariff to be used is easily found when needed. Besides the voucher type VT and the tariff model identifier TM-ID, voucher information VI may comprise also other information like a CV indicating how many months the credit is valid for recharge and a voucher price VP as is illustrated in the example in Figure 2.

**[0024]** The tariff model TM comprises a tariff model identifier ID, weekday definitions WD, time definitions T, prices per minute P and in the example illustrated in Figure 2, also prefixes Pr. With prefixes it is possible to have different call prices within one tariff model to different telephone numbers. The price without a prefix is used when the dialled number does not match any prefix defined in caller's tariff model. Each tariff model comprises preferably a unique tariff scheme. For example tariff model 1 is for persons normally calling during office hours whereas tariff model 2 is for persons calling in the eve-

nings and weekends. In the tariff model 1 the possibility to differentiate call prices by a prefix is used: certain calls to/in Finland are cheaper than other calls during office hours. The tariff models illustrated in Figure 2 are purely illustrative. The service provider can define various tariff models, change definitions and add new models. The tariff model may have different prices for data calls, multimedia calls or messages, short messages, or prices for calls where also the called person is charged, for example. The simplest tariff model is a model where one price is used all the time.

**[0025]** Subscriber information SI comprises in the first preferred embodiment subscribers' phone numbers MSISDNs, each associated with a profile identifier P-ID and a voucher type currently in use VTu. Instead of or in addition to MSISDNs, subscribers identifiers IMSIs may also be used in other embodiments. The profile identifier identifies the profile whose information is to be used with this subscriber.

**[0026]** Predefined profile information PP comprises at least a profile identifier P-ID and voucher types allowed to that profile, VTa. With the allowed voucher types VTa, the service provider can restrict the vouchers the subscriber is allowed to use. One subscriber may use all kind of vouchers, whereas another subscriber may be restricted to only one voucher type. These allowed voucher types are used during recharges as illustrated in greater detail in Figure 4. The predefined profile may also comprise values for different kind of prepaid service attributes, for example an indication how to calculate a new credit when a subscriber deposits.

**[0027]** In the second preferred embodiment of the invention, all subscribers are required to use only one kind of tariffing and only one kind of voucher. Thus the allowed voucher types VTa comprise only one voucher type. The tariff model identifier TM-ID is either in the

voucher information (as in Figure 2) or in the prepaid profile definitions. In the second embodiment there is no need to store information indicating the currently used profile VTu in the subscriber information SI since it is the same as the only allowed voucher type VTa in the prepaid profile information.

**[0028]** The third preferred embodiment of the invention differs from the first preferred embodiment in that no prepaid profiles are used. Thus all subscribers can use all kinds of vouchers. Naturally, in the third preferred embodiment of the invention no prepaid profile information is maintained.

**[0029]** In the fourth preferred embodiment of the invention, all subscribers are required to use only one kind of tariffing but some of them are allowed to use different kind of vouchers. This embodiment differs from the first embodiment of the invention in that the tariff model identifier is defined either in the prepaid profile information or in the subscriber information, not in the voucher information. In this embodiment the difference between vouchers could be the price of the vouchers. Also subscribers having a different prepaid profile can have different kinds of charging, even if they use the same voucher type.

**[0030]** In the fifth preferred embodiment, no prepaid profiles are used and the subscriber information SI also comprises information about allowed voucher types VTa.

**[0031]** In another embodiment of the invention one tariff model is defined to be a default model which is used when no other model is defined for that subscriber or voucher. The advantage of this embodiment is that there is no need to add a tariff model to old subscriber information or voucher information.

**[0032]** These embodiments are only illustrative and different kinds of further embodiments can be built by

taking a single feature or features of them and combining them.

**[0033]** Figure 3 is a flow chart illustrating an example of how the charging base is determined according to the first preferred embodiment of the invention. In this example it will be assumed that the IN and, more precisely, the SCP is responsible for keeping track of the available credit of the prepaid subscriber, but this is not necessary to the invention. It is also possible that it is the MSC (SSP) that keeps track of the available credit of the prepaid subscriber. Another assumption, made here, is that the SCP stores the available credit to an IN database called Service Data Point (SDP, not shown separately in Figure 1) which is a database for the SCP. It is also assumed that the call made here is not an emergency call.

**[0034]** Referring to Figure 3, a prepaid subscriber has dialled numbers indicating that he wants to make a call which is charged from him. The SSP notices that the caller is a prepaid caller and sends a prepaid service request to the SCP. In step 301, the SCP deduces from the service request the caller's identification, which in the first preferred embodiment of the invention is the MSISDN. In step 302, it is checked if the subscriber's available credit is zero, i.e. has he used all his money. Since the available credit is stored in the SDP, it did not have to be transferred to the SCP. If the available credit is zero, call connection is terminated in step 303. In some other embodiments some other credit limit than zero may be used.

**[0035]** If a subscriber still has some money on his account, the SCP obtains in step 304 the voucher type currently in use, VTu, from the subscriber information SI located in the SMP on the basis of the MSISDN. The SCP then obtains in step 305 the tariff model identifier TM-ID from voucher information VI located in the SMP on the basis of VTu. In step 306 the tariff scheme in the tariff

model is obtained from the tariff model information TM located in the SMP on the basis of the TM-ID.

**[0036]** The SCP then notifies in step 307 the switching point (SSP) by sending an instruction message of the events which affect call price formation and are to be reported by the switching point (SSP) to the control point (SCP) in a report message.

**[0037]** When the call is connected, the SCP reduces in step 308 the value of available credit during the call according to the tariff scheme in the tariff model. Naturally, the SCP adapts, when needed, reduction of the available credit according to the messages received from the SSP.

**[0038]** In other embodiments of the invention described in Figure 2, the tariff model to be used may be searched differently from what is described above in Figure 3 depending where and what information is required to find out the tariff model.

**[0039]** In some other embodiments of the invention the SCP may send the MSISDN to the SMP, and SMP carries out the data search described in steps 304-306 and sends as a response to the SCP the tariff scheme in the tariff model.

**[0040]** Figure 4 is a flow chart illustrating the depositing in the first preferred embodiment of the invention. In this example it is assumed that the IVR is taking care of the depositing and the voucher is assumed to be valid. In the example illustrated in Figure 4, it is also assumed that the voucher identification numbers are used to identify the type of the voucher, so that e.g. when two types of vouchers are used, the identification numbers on list 1 are of type 1 and the missing numbers are of type 2. It is, however, irrelevant to the invention how the type of the voucher is determined.

**[0041]** Referring to Figure 4, a subscriber has bought a voucher from a shop, called to the IVR and se-

lected to deposit the voucher. The subscriber is assumed to be a prepaid subscriber, otherwise he cannot deposit. It is also assumed that the IVR checks at the beginning of the call if the caller is a prepaid subscriber, and if not, then the call is disconnected or connected to customer service.

**[0042]** Figure 4 begins in step 401, where the IVR deduces the caller's identification, which is in the first preferred embodiment the MSISDN. On the basis of the MSISDN the IVR obtains, in step 402, the caller's prepaid profile identifier P-ID from the subscriber information SI located in the SMP. On the basis of profile identifier P-ID, the IVR obtains, in step 403, the allowed voucher types VTas from the predefined profile information PP located in the SMP. In embodiments where the profile information also comprises other information related to depositing, this information is also obtained in step 403. In step 404, the IVR prompts the subscriber for voucher identification ID. The voucher identification number ID is received in step 405. The validity of the voucher is checked (not shown in Figure 4) and after that, in step 406, the IVR determines the type T of voucher e.g. by using the identification number and going through list(s) in order to find out the types. After the voucher type T is determined, the IVR checks, in step 407, if the voucher type is an allowed one. In other words, the IVR checks whether the type T belongs to the allowed voucher types VTas. If so, the IVR continues depositing in step 408, the detailed steps of which are not shown in Figure 4. The depositing is carried out according to prior art, but in the future the depositing may also be carried out by new depositing methods not known today. If the deposit was carried out (step 409), in step 410 the IVR sets in the subscriber information the voucher type currently in use VTu to voucher type T and then ends the depositing in step 411, the detailed steps of which are not shown in Figure 4.

**[0043]** If the deposit is not carried out (step 409), e.g. because the caller changes his mind due to losing current credit, then the IVR gives an audio message "goodbye" in step 412 and no subscriber-related information is changed. The call is disconnected.

**[0044]** If the voucher which the caller is trying to deposit is not one of the allowed voucher types (step 407), then the IVR quits without doing any updating and gives in step 412 an audio message telling that the voucher type the caller is trying to deposit, is not an allowed one. The IVR also gives in the audio message the allowed voucher types VTas in step 412.

**[0045]** In some other embodiments of the invention the IVR may send the MSISDN to the SMP, and the SMP performs the data search described in steps 402 and 403 and sends as a response to the SCP the allowed voucher types VTas.

**[0046]** The steps have not been set out in absolute time sequence in Figures 3 and 4. Some of the above steps may take place simultaneously or in a different order, for example steps 401-403 and 404-406. Some steps may also be skipped, like the step 402 in embodiments where subscriber information comprises allowed voucher types VTas. Other steps not shown in Figures 3 and 4 may also occur between the steps stated above. Instead of some steps shown in Figures 3 and 4, some other step having the same result, may be performed. For example in some embodiments, step 304 may be replaced by steps where the voucher number currently in use is used for determining the voucher type.

**[0047]** The present invention can be implemented in existing network elements. They all have processors and a memory with which the inventive functionality described below can be implemented. The functions described above may be located in one network element or some of them may be in one element and the others in

other elements regardless of how they are located in the examples which illustrate the invention.

**[0048]** Although the invention is described above assuming that the subscriber is a prepaid subscriber and the system is a prepaid system, the invention may be implemented also for conventional subscribers who are charged afterwards. When the implementation involves conventional subscribers, the tariff model identifier is preferably added to the subscriber information stored in the subscriber information database, such as a home location register in the GSM system. It is also possible to use profile definitions with conventional subscribers. This invention is not limited to mobile systems but it may be implemented in any kind of telecommunications system, e.g. fixed systems, storing subscriber information, like the PSTN (Public Switch Telephone Network) or the so called third generation system UMTS (Universal Mobile Telecommunications System) and IMT-2000 (International Mobile Telecommunication 2000). It is also possible to provide prepaid service to fixed subscribers in a similar way as is illustrated here with the above figures.

**[0049]** The accompanying drawings and the description pertaining to them are only intended to illustrate the present invention. Different variations and modifications to the invention will be apparent to those skilled in the art, without departing from the scope and spirit of the invention defined in the appended claims.

**Claims**

1. A method for customising the charging of subscribers in a telecommunications network, the method comprising the steps of:

maintaining subscriber information on at least one subscriber;

characterized by

defining at least two different tariff models, each model containing a tariff scheme defining how to charge a call;

indicating in the subscriber information directly or indirectly which tariff model is to be used with this subscriber; and

charging the subscriber according to the tariff scheme of the indicated tariff model.

2. A method as claimed in claim 1, characterized by the method comprising the step of defining one tariff model to be a default model which is used when no other tariff model is indicated.

3. A method as claimed in claim 1 or 2, characterized by the telecommunications network offering a prepaid service to its subscribers and said at least one subscriber being a prepaid subscriber.

4. A method as claimed in claim 3, characterized by the method further comprising the steps of:

using at least two different types of vouchers for making deposis into subscribers prepaid accounts;

attaching one tariff model at least to each of said two different types of vouchers;

indicating in the subscriber information the type of voucher this subscriber is currently using; and

determining the tariff model to be used on the basis of the voucher this subscriber is currently using.

5. A method as claimed in claim 4, characterized by the method further comprising the steps of:

defining in the subscriber information the voucher types allowed to this subscriber;

checking from the subscriber information during depositing if the voucher is allowed to this subscriber; and

if the voucher is an allowed one, continuing depositing;

if the voucher is not an allowed one, terminating depositing.

6. A method as claimed in claim 4, characterized by the method further comprising the steps of:

defining at least two different prepaid profiles, each profile defining at least the allowed voucher types;

associating a subscriber's subscriber information with one profile;

checking during depositing if the voucher is allowed to this subscriber from the profile definitions indicated in the subscriber information; and

if the voucher is an allowed one, continuing depositing;

if the voucher is not an allowed one, terminating depositing.

7. A method as claimed in claims 1, 2 or 3, characterized by the method further comprising the steps of:

defining at least two different subscriber profiles,

attaching at least to each of said two different profiles one tariff model;

indicating in the subscriber information the profile of the subscriber;

determining the tariff model to be used on the basis of the subscriber's profile.

8. A method for customizing the charging of prepaid subscribers in a telecommunications network offering a prepaid service, the method comprising the steps of:

using at least two different types of vouchers for making deposits into subscribers prepaid accounts;

characterized by

defining at least two different tariff models, each model containing a tariff scheme defining how to charge a call;

attaching at least to each of said two types of vouchers one tariff model;

determining the tariff model to be used on the basis of the voucher this subscriber is currently using; and

charging the subscriber according to the tariff scheme of the tariff model.

9. A telecommunications system (S) comprising at least one database (SMP) having subscriber information (SI) on at least one subscriber,

characterized in that

the system (S) is arranged to maintain definitions (TM) of at least two different kinds of tariff models, each tariff model containing a tariff scheme defining how to charge a call, and to charge the subscriber according to the tariff scheme of the tariff model indicated directly or indirectly in the subscriber information (SI).

10. A system (S) as claimed in claim 9, characterized in that the system is arranged to use one tariff model, defined as a default tariff model, when no other tariff model is indicated.

11. A system (S) as claimed in claim 9 or 10, characterized in that the system (S) offers prepaid service to its subscribers and said at least one subscriber is a prepaid subscriber.

12. A system (S) as claimed in claim 11, characterized in that the system (S) is arranged to use at least two different types of vouchers for depositing subscribers prepaid accounts, and to maintain information on types of vouchers allowed to the subscriber and to check during depositing if the voucher the subscriber is depositing is an allowed one.

13. A network element (SCP) controlling charging of a subscriber in a telecommunications system, the network element being arranged to be in connection with the subscriber information maintained in telecommunications system,

characterized in that

the network element (SCP) is arranged to find out which of the tariff models defined in the system is to be used with this subscriber from the subscriber information indicating the subscriber's tariff model directly or indirectly, each tariff model containing a tariff scheme defining how to charge a call, and to use the tariff scheme of the indicated tariff model when charging the subscriber.

14. A database (SMP) comprising subscriber information in a telecommunications system,

characterized in that

the database (SMP) also comprises at least two different kinds of tariff models (TM), each model containing a tariff scheme defining how to charge a call, and

the subscriber information (SI) indicates directly or indirectly which tariff model is to be used with a subscriber.

15. A database (SMP) as claimed in claim 14, characterized in that

the database also comprises at least two different kinds of profile definitions (PP) to each of which one tariff model is attached,

the subscriber information (SI) comprises information on which profile to use with the subscriber, and

the database (SMP) is arranged to deduce the tariff model of the subscriber from the profile.

16. A database (SMP) as claimed in claim 14, characterized in that

the telecommunications system is a system offering a prepaid service to subscribers and the subscribers may deposit their prepaid accounts by means of vouchers,

the database also comprises voucher information (VI) for at least two different types of vouchers,

the subscriber information (SI) comprises information on the type of voucher the subscriber is currently using, and

the database (SMP) is arranged to deduce the tariff model of the subscriber from the voucher information (VI) on the basis of the voucher type the subscriber is currently using.

17. A database (SMP) comprising voucher information (VI) in a telecommunications system offering a prepaid service to subscribers, in which system the sub-

scribers may deposit their prepaid accounts by means of vouchers,

characterized in that

the database (SMP) also comprises at least two different kinds of tariff models (TM), each model containing a tariff scheme defining how to charge a call,

the voucher information comprises information on at least two different types of vouchers, attaching each of said at least two different types of vouchers to one tariff model, and

the database (SMP) is arranged to deduce the tariff model of a subscriber from the voucher information (VI) on the basis of the voucher type the subscriber is currently using.

**(57) Abstract**

To be able to customize subscriber charging in a telecommunications system, at least two different kinds of tariff models (TM) are defined, each model containing a tariff scheme defining how to charge a call. The tariff model to be used with a subscriber is directly or indirectly indicated in subscriber information (SI).

(Figure 2)

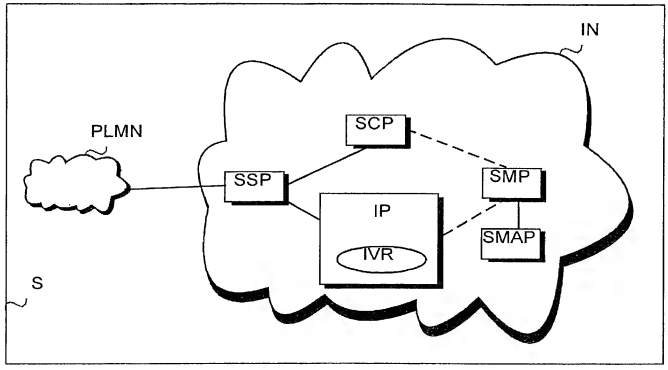


FIG.1

| ID | WD | T | P | Pr |
|---|---|---|---|---|
| 1 | Mo-Fr | 8-16 | 1.1 | +3589511 |
| 1 | Mo-Fr | 8-16 | 1.2 | +35850522 |
| 1 | Mo-Fr | 8-16 | 1.5 | |
| 1 | Mo-Fr | 16-8 | 1 | |
| 1 | Sa,Su | 0-24 | 1 | |
| 2 | Mo-Fr | 8-16 | 3 | |
| 2 | Mo-Fr | 16-24 | 0.8 | |
| 2 | Mo-Fr | 0-8 | 0.5 | |
| 2 | Sa,Su | 0-8 | 0.5 | |
| 2 | Sa,Su | 8-24 | 0.8 | |

TM

| P-ID | VTa |
|---|---|
| Business | a, b |
| Private | b |

PP

SI

| VT | TM-ID | CV | VP |
|---|---|---|---|
| a | 1 | 1 | 1000 |
| b | 2 | 6 | 100 |

VI

| MSISDN | P-ID | VTu |
|---|---|---|
| 123 | Business | a |
| 127 | Private | b |

SMP

FIG.2

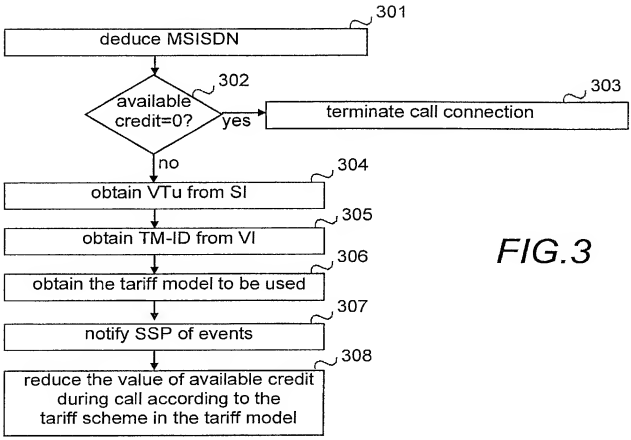
301
deduce MSISDN
302
available credit=0?
yes
303
terminate call connection
no
304
obtain VTu from SI
305
obtain TM-ID from VI
306
obtain the tariff model to be used
307
notify SSP of events
308
reduce the value of available credit during call according to the tariff scheme in the tariff model

FIG.3

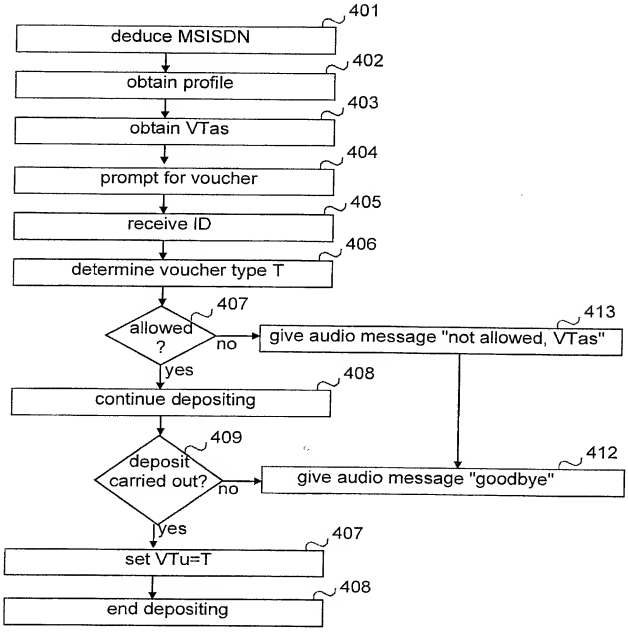
401
deduce MSISDN
402
obtain profile
403
obtain VTas
404
prompt for voucher
405
receive ID
406
determine voucher type T
407
allowed ?
no
413
give audio message "not allowed, VTas"
yes
408
continue depositing
409
deposit carried out?
no
412
give audio message "goodbye"
yes
407
set VTu=T
408
end depositing

FIG.4

**FOR UTILITY/DESIGN**
**CIP/PCT NATIONAL/PLANT**
**ORIGINAL/SUBSTITUTE/SUPPLEMENTAL**
**DECLARATIONS**

**RULE 63 (37 C.F.R. 1.63)**
**DECLARATION AND POWER OF ATTORNEY**
**FOR PATENT APPLICATION**
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**PW**
**FORM**

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the **INVENTION ENTITLED Charging for prepaid subscribers in a telecommunications system**

the specification of which (CHECK applicable BOX(ES) )

X A. ☐ is attached hereto.

BOX(ES) → B. ☐ was filed on _____ as U.S. Application No. _____ /

→ → C. ☒ was filed as PCT International Application No. PCT/ FI00 / 00742 on 1 September 2000

and (if applicable to U.S. or PCT application) was amended on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C F R 1 56 Except as noted below, I hereby claim foreign priority benefits under 35 U S C 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International Application which designated at least one other country than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international Application, filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which priority is claimed, or (2) if no priority claimed, before the filing date of this application

| PRIOR FOREIGN APPLICATION(S) Number | Country | Day/MONTH/Year Filed | Date first Laid-open or Published | Date Patented or Granted | Priority NOT Claimed |
|---|---|---|---|---|---|
| 19991874 | Finland | 2 September 1999 | | | |

If more prior foreign applications, X box *at bottom* and continue on attached page.

Except as noted below, I hereby claim domestic priority benefit under 35 U S C 119(e) or 120 and/or 365(c) of the indicated United States applications listed below and PCT international applications listed above or below and, if this is a continuation-in-part (CIP ) application, insofar as the subject matter disclosed and claimed in this application is in addition to that disclosed in such prior applications, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F R 1 56 which became available between the filing date of each such prior application and the national or PCT international filing date of this application

| PRIOR U.S. PROVISIONAL, NONPROVISIONAL AND/OR PCT APPLICATION(S) Application No. (series code/serial no.) | Day/MONTH/Year Filed | Status pending, abandoned, patented | Priority NOT Claimed |
|---|---|---|---|
| | | | |

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

And I hereby appoint Pillsbury Winthrop LLP, Intellectual Property Group, telephone number (202) 861-3000 (to whom all communications are to be directed), and persons of that firm who are associated with USPTO Customer No 909 (see below label) individually and collectively my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent, and I hereby authorize them to delete from that Customer No names of persons no longer with their firm, to add new persons of their Firm to that Customer No , and to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct the above Firm and/or an attorney of that Firm in writing to the contrary

**USE ONLY FOR**
**PILLSBURY WINTHROP**

*00909*
00909

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☐ FOR ADDITIONAL INVENTORS see attached page.

☐ See additional foreign priorities on attached page (incorporated herein by reference).

Atty. Dkt. No. P _____
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